

The opinion in support of the decision being entered today was *not* written for publication and is *not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte HANS BIERMAIER

Appeal 2007-0863
Application 09/831,585
Technology Center 1700

Decided: May 23, 2007

Before EDWARD C. KIMLIN, BRADLEY R. GARRIS, and
CHUNG K. PAK, *Administrative Patent Judges*.

KIMLIN, *Administrative Patent Judge*.

This is an appeal from the final rejection of claims 11, 13-22 and 24-30. Claim 11 is illustrative:

11. A device for thermal sterilization of liquids comprising:
a counterflow heat exchanger including a conduit with a heating
section and a cooling section in fluid connection with one another
a heating source for heating the liquid,
the heating section and the cooling section being spirally arranged
around the heating source,

the heating source being generally located in the center of the spiral,
said conduit being constructed of flexible material,
individual windings of conduit lying one on the other and contacting
each other, and
a check valve for allowing liquid flow only in a direction from the
heating section to the cooling section.

The Examiner relies upon the following references in the rejection of
the appealed claims:

Hakim-Elahi	US 5,251,689	Oct. 12, 1993
Suchomel	US 5,687,678	Nov. 18, 1997
Laing	US 6,059,965	May 9, 2000
Gunn	US 6,402,897 B1	Jun. 11, 2002

Appellant's claimed invention is directed to a device for the thermal sterilization of liquids. The device comprises a counterflow heat exchanger having a conduit with heating and cooling sections in fluid connection with one another. The conduit is "constructed of flexible material" (claim 11).

Claims 22 and 30 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Laing. The appealed claims also stand rejected under 35 U.S.C. § 103(a) as follows:

- (a) claims 11, 13, 14, 20, 21, 23, and 29 over Lang in view of Gunn,
- (b) claim 24 over Laing in view of Hakim-Elahi,
- (c) claims 26-28 over Laing in view of Suchomel,
- (d) claims 15, 16, and 25 over Laing in view of Gunn and Hakim-Elahi, and

(e) claims 17-19 over Laing in view of Gunn and Suchomel.

We have thoroughly reviewed each of Appellant's arguments for patentability. However, we are in full agreement with the Examiner that the claimed subject matter is unpatentable over the cited prior art. Accordingly, we will sustain the Examiner's rejections for the reasons set forth in the Answer, and we add the following for emphasis only.

We consider first the Examiner's rejection of claims 22 and 30 under § 102 over Laing. The principal argument advanced by Appellant is that "Laing fails to disclose a thermal sterilizer for liquids comprising **a conduit constructed of flexible material**" (sentence bridging pp. 6 and 7 of Br.). Appellant does not dispute the Examiner's factual determination that Laing describes the other claimed features of a thermal sterilizer for liquids. However, Appellant, while acknowledging that Laing discloses that the conduit is preferably made from plastic, contends that the walls of the conduit must be **rigid** in order to remain in place when they are arranged to extend into slots 5, 6, 7, and 12 (*see* p. 7 of Br., third para.). Appellant maintains that "no where does Laing explicitly state that the heat transferring walls are constructed from a flexible material" (p. 8 of Br., second para.).

As explained by the Examiner, Appellant's Specification does not disclose the parameters that define what constitutes a flexible material, i.e., Appellant's Specification does not set forth the modulus of elasticity for the conduit material that is recited as flexible. Consequently, the appealed claims embrace within their scope materials having a wide range of flexibility, including materials that are only slightly flexible. Inasmuch as the plastic conduits of Laing are thin tubes that are formed in a spiral configuration, we agree with the Examiner that it is reasonable to conclude

that the plastic conduits of Laing have some degree of flexibility and, therefore, fall within the scope of the appealed claims. We note that Appellant has not explained why the conduit of Laing cannot possess some degree of flexibility in order to be inserted in the slots/grooves formed in the housing, and Appellant has not refuted the Examiner's factual finding that the spirally configured tubes of Laing "would require flexibility in order to be formed" (p. 9 of Answer, second para.).

We now turn to the Examiner's § 103 of claims 11, 13, 14, 20, 21, 23, and 29 over Laing in view of Gunn. Appellant's argument with respect to claims 11, 13, and 14, as a group, are limited to the asserted deficiency of Laing discussed above regarding the claimed flexible material. As for claims 20 and 29, we agree with the Examiner that Gunn establishes the obviousness of substituting a metal film for the plastic material of Laing's conduit. While Appellant submits that "the thin sheets of metal disclosed in Gunn appear to be rigid" (p. 12 of Br., last para.), we find that one of ordinary skill in the art would have found it obvious to make the spiral conduits of Laing from metal that has some degree of flexibility. It is not necessary for a finding of obviousness that the metal used in Gunn's system be flexible. Also, Appellant does not present a separate substantiative argument for claim 21.

As for separately argued claim 24, with which claims 15, 16 and 25 stand or fall, we fully concur with the Examiner that it would have been obvious for one of ordinary skill in the art to use the elastic material taught by Hakim-Elahi in designing the coiled heat exchanger of Laing in order to facilitate its formation. As acknowledged by Appellant, "elastic materials have been used before in heat exchangers" (p. 13 of Br., last para.). While

Appellant maintains that “the heat transferring walls of Laing need to be rigid for Laing’s design to work” (p. 14 of Br., first sentence), Appellant has not explained why one of ordinary skill in the art would not have found it obvious to use an elastic material in forming the spiral conduit of Laing that also has sufficient rigidity to be operable. Manifestly, there are a host of plastic and metal materials available to one of ordinary skill in the art that have the proper balance of flexibility and rigidity. In our view, one of ordinary skill in the art would have had to resort to only routine experimentation to arrive at the proper balance.

Finally, concerning the § 103 rejection of claim 17-19 and 26-28 over the additional disclosure of Suchomel, we agree with the Examiner that Suchomel evidences the obviousness of arranging the conduits coaxially one inside the other, or applying in the same plane, or in a spiral form. Appellant does not contest the Examiner’s factual finding that “[t]he Suchomel reference, which is in the art of heating water by using spiral heat exchanger, teaches individual conduits arranged coaxially one inside the other (Fig. 3, 22, inner and outer tubings) and individually windings lie in the same plane (Fig. 3, two bottom tubings 22, lie in the same plane) [and] arranged in a cylindrical shape (Fig. 3, 22)” (sentence bridging pp. 6 and 7 of Answer). Suchomel establishes that there was a wide variety of configurations for heat exchanging conduits in the prior art at the time of filing the present application, and Appellant has not established that the claimed arrangements were anything more than a design choice that would have been obvious to one of ordinary skill in the art. Appellant has not demonstrated that any of the specifically claimed configurations produces a result that would have been unobvious to one of ordinary skill in the art.

As a final point, with respect to the Examiner's § 103 rejections, we note that Appellant bases no argument upon objective evidence of nonobviousness, such as unexpected results, which would serve to rebut the *prima facie* case of obviousness established by the Examiner.

In conclusion, based on the foregoing and the reasons well stated by the Examiner, the Examiner's decision rejecting the appealed claims is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

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